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| 10/682,316 | 10/09/2003 | Shan Liu | SAM2.0030 | 9831 |

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| EXAMINER | |
|---|---|
| WONG, ALLEN C | |
| **ART UNIT** | **PAPER NUMBER** |
| 2621 | |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| | | | |
|---|---|---|---|
| ***Office Action Summary*** | **Application No.**<br>10/682,316 | **Applicant(s)**<br>LIU ET AL. | |
| | **Examiner**<br>Allen Wong | **Art Unit**<br>2621 | |

***-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --***

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1)☒ Responsive to communication(s) filed on *12 July 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,6,11,13,15 and 25* is/are rejected.

7)☒ Claim(s) *2-5,7-10,12,14,16-24 and 26-28* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

## Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### ***Response to Arguments***

1. Applicant's arguments filed 7/12/07 have been fully read and considered but they are not persuasive.

Dependent claims 2-5, 7-10, 12, 14, 16-24 and 26-28 are still objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The minor objection to claim 19 is withdrawn after the current claim amendment.

Regarding lines 11-12 on page 12 of applicant's remarks, applicant contends that Lee and Webb do not disclose the limitations of "calculating a 'stochastic measure' of an area of a frame 'based on the standard deviation of differences in pixel values' in two frames in the temporal domain"; and "detecting 'an opaque image' by 'comparing the stochastic measure' with a given noise level". The examiner respectfully disagrees. In column 4, lines 20-43, Lee discloses the calculation of the MAD (mean absolute value) and the dMAD (difference mean absolute value) values, wherein both the stochastic MAD and dMAD obtain the aggregate pixel value data from the successive image frames. Thus, Lee discloses "calculating a 'stochastic measure' of an area of a frame 'based on the standard deviation of differences in pixel values' in two frames in the temporal domain". Lee does not specifically disclose "detecting 'an opaque image' by 'comparing the stochastic measure' with a given noise level". However, in column 1, lines 59-64 and column 2, lines 12-30, Webb discloses that element 104 determines the reduced noise version, ie. opaque image, between elements 108 and 109 with the given noise level from element 112 or 113. Thus, Webb teaches the reduction of noise levels with comparison to a threshold value. Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Lee and Webb as a whole for reducing noise on images displayed at the output, as suggested in Webb's column 1, lines 59-60.

Regarding lines 13-17 on page 12 of applicant's remarks, applicant states that the "opaque image" is not disclosed, and that Lee has nothing to do with "detecting logos". The examiner respectfully disagrees. The term "opaque image" can and is reasonably interpreted as reduced noise version, difference image or any anomaly detected in the image data. Further, the term "logo" is not specifically disclosed in the claims to specify what the term "opaque image" represents.

Regarding the first paragraph on page 13 of applicant's remarks, applicant asserts that Lee does not disclose "stochastic measure", and that the MAD and dMAD are not stochastic functions. The examiner respectfully disagrees. This argument is incorrect because the term "stochastic" is a well known term that is defined as "involving probability", as specified in Webster's Dictionary. Since MAD and dMAD are well known as "means" or averaging process of pixilated data that involves probability. The term "stochastic" is considered general knowledge accepted and well known by academics, and that the mean and standard deviation are the basic terminology in statistical analysis and statistical probabilities. Thus, the data obtained by MAD and dMAD are probability measures or stochastic measures since the image data obtained by the mean functions pertaining to probabilities. Thus, Lee citations of MAD and dMAD reasonably meet the broadly claimed "stochastic measure".

Regarding lines 1-2 on page 14, applicant states that Lee does not disclose "standard deviation". The examiner respectfully disagrees. The terms MAD and dMAD are well known as "means" or averaging process of pixilated data that involves probability. The term "stochastic" is considered general knowledge accepted and well known by academics, and that the mean and standard deviation are the basic terminology in statistical analysis and statistical probabilities. Thus, the data obtained by MAD and dMAD are probability measures or stochastic measures since the image data obtained by the mean functions pertaining to probabilities. Thus, Lee citations of MAD and dMAD reasonably meet the broadly claimed "stochastic measure".

Regarding lines 2-7 on page 14 of applicant's remarks, applicant states that

> Lee and Webb do not disclose the limitations of "calculating a 'stochastic measure' of an area of a frame 'based on the standard deviation of differences in pixel values' in two frames in the temporal domain"; and "detecting 'an opaque image' by 'comparing the stochastic measure' with a given noise level". The examiner respectfully disagrees. In column 4, lines 20-43, Lee discloses the calculation of the MAD (mean absolute value) and the dMAD (difference mean absolute value) values, wherein both the stochastic MAD and dMAD obtain the aggregate pixel value data from the successive image frames. Thus, Lee discloses "calculating a 'stochastic measure' of an area of a frame 'based on the standard deviation of differences in pixel values' in two frames in the temporal domain". Lee does not specifically disclose "detecting 'an

opaque image' by 'comparing the stochastic measure' with a given noise level". However, in column 1, lines 59-64 and column 2, lines 12-30, Webb discloses that element 104 determines the reduced noise version, ie. opaque image, between elements 108 and 109 with the given noise level from element 112 or 113. Thus, Webb teaches the reduction of noise levels with comparison to a threshold value. Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Lee and Webb as a whole for reducing noise on images displayed at the output, as suggested in Webb's column 1, lines 59-60.

Regarding lines 8-9 and 17-20 on page 14 of applicant's remarks, applicant states that Lee and Webb do not deal with "logo". As previously addressed, the term "opaque image" can and is reasonably interpreted as reduced noise version, difference image or any anomaly detected in the image data. Further, the term "logo" is not specifically disclosed in the claims to specify what the term "opaque image" represents.

Regarding lines 9-10 on page 10 of applicant's remarks, applicant states that Webb is silent to the term "stochastic measure" and "standard deviation". The examiner respectfully disagrees. As previously stated, the term "stochastic" is considered general knowledge accepted and well known by academics, and that the "mean" and "standard deviation" are the basic terminology in statistical analysis and statistical probabilities. In column 1, lines 59-64 and column 2, lines 12-30, Webb discloses that element 104 determines the reduced noise version, ie. opaque image, between elements 108 and 109 with the given noise level from element 112 or 113. Thus, Webb teaches the reduction of noise levels with comparison to a threshold value. Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Lee and Webb as a whole for reducing noise on images displayed at the output, as suggested in Webb's column 1, lines 59-60.

Regarding lines 14-15 on page 14 and lines 1-5 on page 15 of applicant's remarks, applicant states Lee and Webb do not disclose the claimed invention and that Lee and Webb are not combinable. The examiner respectfully disagrees. See the analysis as stated for how the limitations of the present invention are disclosed by Lee and Webb. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, it would have been obvious to one of ordinary skill in the art to combine the teachings of Lee and Webb as a whole for reducing noise on images displayed at the output, as suggested in Webb's column 1, lines 59-60.

It must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See In re McLaughlin, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See In re Keller, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); In re Merck & Co., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Dependent claims 6, 11, 13 and 25 are rejected for similar reasons as claims 1 and 15 as stated in the above and the rejection below.

Thus, the rejection of claims 1, 6, 11, 13, 15 and 25 is maintained.

## ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 6, 11, 13, 15 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (5,617,149) in view of Webb (6,847,408).

Regarding claim 1, Lee discloses a method of detecting an opaque image in an area of each of a sequence of frames comprising pixels that represent digital video images, comprising the steps of:

detecting a scene change between at least two of said frames, designated as a current frame and a reference frame (col.3, ln.42-51; Lee discloses the determination of scene change between frames $f_n$ versus $f_{n-1}$; see fig.5-6);

upon detecting a scene change, calculating a stochastic measure $\sigma_d$ of a plurality of pixels in the image frame based on the standard deviation of differences in pixel values in said two frames in the temporal domain (col.4, ln.20-43; Lee discloses the calculation of the MAD (mean absolute value) and the dMAD (difference mean absolute value) values, wherein both the stochastic MAD and dMAD obtain the aggregate pixel value data from the successive image frames).

Lee does not specifically disclose detecting an opaque image in said area by comparing the stochastic measure $\sigma_d$ with a given noise level (STD). However, Webb teaches the reduction of noise levels with comparison to a threshold value (col.1, ln.59-64 and col.2, ln.12-30, Webb discloses that element 104 determines the reduced noise version, ie. opaque image, between elements 108 and 109 with the given noise level from element 112 or 113). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Lee and Webb as a whole for reducing noise on images displayed at the output (Webb col.1, ln.59-60).

Regarding claim 6, Lee does not specifically disclose wherein the steps of detecting a scene change further includes the steps of: generating a count C of the number pixels in the current frame whose difference in intensity relative to corresponding pixels in the reference frame, after subtracting the given noise mean, exceeds the threshold value. However, Webb teaches the generation of a count of pixel values (fig.1, element 104 and col.2, ln.13-26). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Lee and Webb as a whole for reducing noise on images displayed at the output (Webb col.1, ln.59-60).

Regarding claim 11, Lee does not specifically disclose wherein the step of detecting an opaque image further includes the steps of: classifying each pixel in said area of the current frame as an opaque image pixel, if the $\sigma_d$ for that pixel matches the given noise level, represented by the standard deviation $\sigma_s$. However, Webb teaches the reduction of noise levels with comparison to a threshold value (col.1, ln.59-64 and col.2, ln.12-30, Webb discloses that element 104 determines the reduced noise version, ie. opaque image, between elements 108 and 109 with the given noise level from element 112 or 113). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Lee and Webb as a whole for reducing noise on images displayed at the output (Webb col.1, ln.59-60).

Regarding claim 13, Lee does not specifically disclose further comprising the steps of: detecting and reclassifying any mis-classified pixels in a refinement process. Webb teaches the detection and reclassification of pixels (fig.1, element 104 and col.2, ln.13-26). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Lee and Webb as a whole for reducing noise on images displayed at the output (Webb col.1, ln.59-60).

Regarding claim 15, Lee discloses an opaque image detection system for detecting an opaque image in an area of each of a sequence of frames including pixels that represent digital video images, comprising:

a scene change detector that detects scene change between at least two of said frames, designated as a current frame and a reference frame (col.3, ln.42-51; Lee discloses the determination of scene change between frames $f_n$ versus $f_{n-1}$; see fig.5-6);

a stochastic characteristic generator that upon detection of scene change by the scene change detector, calculates a stochastic measure $\sigma_d$ of said area based on the standard deviation of differences in pixel values in said two frames in the temporal domain (col.4, ln.20-43; Lee discloses the calculation of the MAD (mean absolute value) and the dMAD (difference mean absolute value) values, wherein both the stochastic MAD and dMAD obtain the aggregate pixel value data from the successive image frames).

Lee does not specifically disclose an opaque image detector that detects an opaque image in said area by comparing the stochastic measure $\sigma_d$ with a given noise level, represented by the standard deviation $\sigma_s$. However, Webb teaches the reduction of noise levels with comparison to a threshold value (col.1, ln.59-64 and col.2, ln.12-30, Webb discloses that element 104 determines the reduced noise version, ie. opaque image, between elements 108 and 109 with the given noise level from element 112 or 113). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Lee and Webb as a whole for reducing noise on images displayed at the output (Webb col.1, ln.59-60).

Regarding claim 25, Lee does not specifically disclose wherein the opaque image detector further classifies each pixel in said area of the current frame as an opaque image pixel, if the $\sigma_d$ for that pixel matches a given noise level, represented by the standard deviation $\sigma_s$. However, Webb teaches the reduction of noise levels with comparison to a threshold value (col.1, ln.59-64 and col.2, ln.12-30, Webb discloses that element 104 determines the reduced noise version, ie. opaque image, between elements 108 and 109 with the given noise level from element 112 or 113). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Lee and Webb as a whole for reducing noise on images displayed at the output (Webb col.1, ln.59-60).

## ***Allowable Subject Matter***

Claims 2-5, 7-10, 12, 14, 16-24 and 26-28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

## ***Conclusion***

3. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

## *Contact Information*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen Wong whose telephone number is (571) 272-7341. The examiner can normally be reached on Mondays to Thursdays from 8am-6pm Flextime.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John W. Miller can be reached on (571) 272-7353. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Allen Wong
Primary Examiner
Art Unit 2621

AW
9/24/07